



MyoTrac Infiniti™ System

For Muscle Re-education, Rehabilitation and the Treatment of Incontinence.

MyoTrac Infiniti allows you to measure two channels of high-resolution surface electromyography (SEMG) and provide 2 channels of electrical stimulation (STIM) in a wide variety of configurations. MyoTrac Infiniti stands apart from the competition by including SEMG-triggered stimulation (ETS), where the SEMG signal is used to trigger stimulation - to help patients improve volitional activation of target muscle groups. This combination of three modalities enhances treatment possibilities and eliminates the requirements for multiple devices.

Embedded Features:

- Stand Alone device with LCD and touch screen
- 2 channels of SEMG
- 2 channels of STIM
- 2 channels of combined EMG and STIM (including ETS)
(ETS cannot be used in the USA for the treatment of incontinence)
- Bar graphs, line graphs, digital read outs
- Audio-feedback and alarms
- Auto-thresholds
- On board memory - saves SEMG statistical summary data.
- Over 50 pre-programmed protocols
- Patient lock & Rental lock features
- Compact Flash and Report Software



Extensive Documentation

MyoTrac Infiniti has been designed by and for physical therapists. It comes with a clinical guide, explaining the general concepts of the three dynamic modalities, the placement of the electrodes and various clinical protocols.

Representations of the SEMG signal
The Raw SEMG is an unprocessed SEMG signal, which consists of a collection of negative electrical signals. Their frequency (how often they occur), and their information on the contraction or rest state of the muscle. A raw SEMG signal is shown in Fig 1.

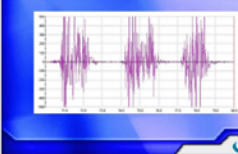


Fig 1. Raw EMG (three contractions)

In the raw graph the X axis displays time and the Y axis displays amplitude in both positive and negative about the axis which is zero. As the subject contracts the number and amplitude of the lines increase, as the muscle relaxes they decrease.

RMS or Root Mean Square is a technique for rectifying the raw signal and its amplitude envelope, to make it easier to view. It represents the mean power signal can be seen in Fig 2.

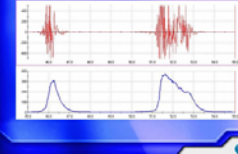


Fig 2. Raw EMG in red (top) and equivalent RMS EMG in blue (bottom)

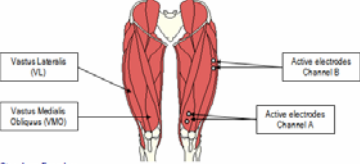
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PATELLOFEMORAL PAIN EVALUATION
Patellofemoral pain is a common ailment affecting one in four of the general population. It is caused by a variety of factors including abnormal lower limb mechanics, Vastus Medialis Obliquus (VMO) insufficiency, tight lateral structures and tight anterior and posterior muscles.


The condition often develops gradually and is characterized by a diffuse ache of the anterior knee. Note that another common pain is Chondromalacia, which is distinct from Patellofemoral pain. The former is caused by a softened and fissured patellar under-surface as seen during diagnostic imaging or surgery.

The VMO muscle is the only dynamic medial stabilizer of the patella, and is active throughout the full range of the extension of the knee.

Placement of the electrodes:
Place the active electrodes of channel A on the Vastus Medialis Obliquus (VMO) and the active electrodes of channel B on the Vastus Lateralis (VL), as shown in the picture. The reference electrodes have to be placed proximally (above the active electrodes, closer to the trunk).



Step-down Exercise:
The involved leg should remain on the step block. The good leg steps up, joining the other leg, then steps down.



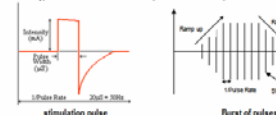
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ELECTRO-STIMULATION (NMES)

NMES Basics
Neuromuscular Electrical Stimulation (NMES) is used in order to stimulate muscle control. Bursts of electrical pulses are delivered to targeted muscles via electrodes which cause motion in the muscles.

The NMES parameters are the following:
Pulse Width – The duration of each individual pulse.
Pulse Rate – The rate at which a number of pulses are delivered.
Intensity – The intensity in mA that is delivered by each pulse. The maximum intensity is 100mA, determined with an input impedance of 500Ω. The maximum intensity that you could use is determined by the electrode size that you are using and may be more than 100mA.
Ramp – The time it takes for the intensity of successive pulses to reach the preset maximum or back to zero from the start or the end of a series of pulses.

Below are a typical waveform for a stimulation pulse and a burst of pulses.




A burst is always followed by a resting period, to avoid the muscle to fatigue.

Indications for NMES:







- Prevention or reduction of disuse atrophy
- Increasing local blood circulation
- Muscle re-education
- Immediate post-surgical stimulation of calf muscles to prevent venous thrombosis
- Maintaining or increasing range of motion
- Muscle rehabilitation after a stroke
- Relaxation of muscle spasms

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NMES - Lower Arm



Electrode Placements

Brachioradialis	Extensor Carpi Ulnaris	Extensor Carpi Radialis
		
		
The Brachioradialis is implicated in the flexion of the elbow.	The Extensor Carpi Ulnaris is implicated in the pronation of the lower arm.	The Extensor Carpi Radialis is implicated in the extension and abduction of the wrist.

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Clinically Relevant Software

The clinical system is further enhanced by the powerful BioGraph Infiniti software and its SEMG Rehab Suite, which combines dynamic graphics, with analysis and reporting functions, the result of 30 years of experience in Biofeedback.

The software proposes various assessment and training protocols with very helpful guidelines for beginners, as well as experts.



On-line Instructions
with Video



Attractive Graphics &
Animations



Games



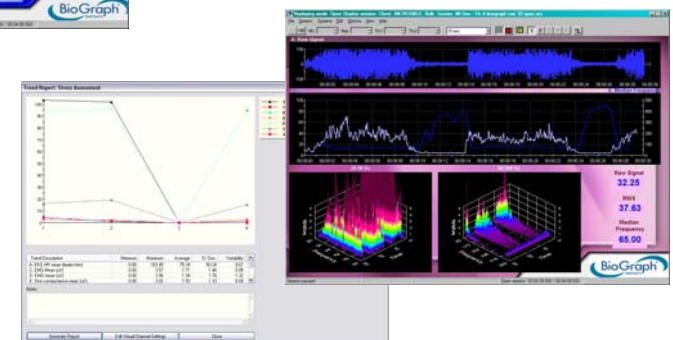
DVD controlled by
SEMG



Webcam



Templates



Advanced Analysis & Progress Report

Benefits

By providing the user, and their therapist, access to muscular information about which they are both generally unaware, SEMG biofeedback provides accurate, reliable, measurable, objective data to augment and support the subjective reporting of the patient and observations of the therapist.

The microvolt values (millionths of a volt) measurements of muscle activity can be recorded and used to provide both instant feedback for motivation, learning and improved rehabilitation and display trend reports over sessions, to demonstrate with objective numbers, the value of the therapy both to the patient and the service provider or payer.

Already used and loved by many practitioners ...

"MyoTrac Infiniti allows rehabilitation professionals to access activity - dependent neural plasticity, by providing closed loop re-training of brain function in both children and adults with limitations of spontaneous movement. I expect that it will revolutionize our approach to a wide range of neurological disorders."

*Karen E. Pape, MD, FRCPC, FAAP
Medical Director of the TASC Network*

"The MyoTrac Infiniti is a very user friendly SEMG unit that enables clinicians to have access to important information that would otherwise be missed."

*Jean-Pierre Dumas M.Sc. PT
McGill University, Canada*